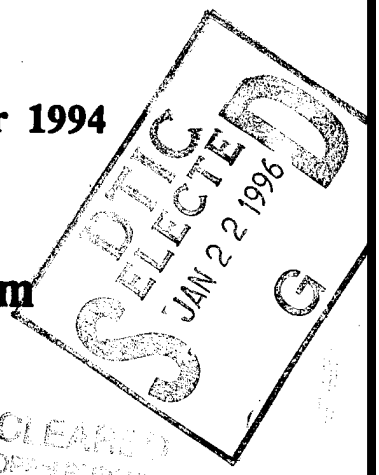
Quarterly Technical Report No.10
October 20,1995

Reporting Period: 01 October 1994 - 31 December 1994



Optoelectronic Technology Consortium

Sponsored by:

Defense Advanced Research Projects Agency
Microelectronics Technology Office

(PRECOMPETATIVE CONSORTIUM FOR OPTOELECTRONIC INTERCONNECT TECHNOLOGY)

ARPA Order No.8351C

Issued by DARPA/CMO under Contract #MDA972-92-C-0071

Effective Contract Date: 01 July 1992

Contract Expiration Date: 31 March 1995

Contract Amount: $2,372,699.00

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OFFICE OF THE UNDER SECRETARY OF DEFENSE (ACQUISITION & TECHNOLOGY)
DEFENSE TECHNICAL INFORMATION CENTER
8725 JOHN J KINGMAN RD STE 0944
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IN REPLY
REFER TO

DTIC-OMI

SUBJECT: Distribution Statements on Technical Documents

TO:

ARPA/T10
ATTN: MS. COX
3701 NORTH FAIRFAX DRIVE
ARLINGTON, VA 22203-1714

1. Reference: DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87.

2. The Defense Technical Information Center received the enclosed report (referenced below) which is not marked in accordance with the above reference.

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3. We request the appropriate distribution statement be assigned and the report returned to DTIC within 5 working days.

4. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Input Support Branch, (703) 767-9092, 9088 or 9086 (DSN use prefix 427).

FOR THE ADMINISTRATOR:

1 Encl

CRYSTAL RILEY
Chief, Input Support Branch

FL-171
Dec 95

DoD Directive 5230.24, "Distribution Statements on Technical Documents," 18 Mar 87, contains seven distribution statements, as described briefly below. Technical Documents that are sent to DTIC **must** be assigned one of the following distribution statements:

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DISTRIBUTION AUTHORIZED TO U. S. GOVERNMENT AGENCIES AND PRIVATE INDIVIDUALS OR ENTERPRISES ELIGIBLE TO OBTAIN EXPORT-CONTROLLED TECHNICAL DATA IN ACCORDANCE WITH DoD DIRECTIVE 5230.25 (DATE STATEMENT APPLIED). CONTROLLING DoD OFFICE IS (INSERT).

Unlimited Distribution
(Reason)

OASB / TIO
(Assigning Office)

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JAN 3 1996
(Date Statement Assigned)

OPTOELECTRONIC TECHNOLOGY CONSORTIUM
Quarterly Technical Report No. 10
October 1 to December 31, 1994
Honeywell, Inc.

1.0 Introduction.

The Optoelectronic Technology Consortium has been established to position U.S. industry as the world leader in optical interconnect technology by developing, fabricating, integrating and demonstrating the producibility of optoelectronic components for high-density/high-data-rate processors and accelerating the insertion of this technology into military and commercial applications. This objective will be accomplished by a program focused in three areas.

> Demonstrated performance: OETC will demonstrate an aggregate data transfer rate of 16 Gb/s between single transmitter and receiver packages.
>
> Accelerated development: By collaborating during the precompetitive technology development stage, OETC will advance the development of optical components and produce links for a multiboard processor testbed demonstration.
>
> Producibility: OETC's technology will achieve this performance by using components that are affordable, and reliable, with a line BER<10^{-15} and MTTF>10^{6} hours.

Under the OETC program Honeywell will develop packaged AlGaAs arrays of waveguide modulators and polymer based, high density, parallel optical backplane technology compatible with low-cost manufacturability. The scope of the program has been modified, such that the number of packaged waveguide modulator arrays to be fabricated under the program will be reduced, and efforts are initiated in the development of Vertical Cavity Surface Emitting Lasers.

The packaged AlGaAs modulator arrays will consist of a single fiber input, a 1x4 fanout circuit, four waveguide modulators, and four fiber outputs, all mounted on a ceramic header. The primary benefits to this approach are enhanced system reliability, particularly at high temperatures, and a device design that is highly producible due to the inherent process tolerance. Combined with the demonstrated high density of these devices when fabricated in arrays, this allows the development of compact and reliable transmitter components.

The objective of the polyimide backplane development effort is to demonstrate a practical high density (>20 lines or channels per mm) parallel optical backplane facilitating (bandwidth x length/power) interconnect figures of merit between one and two orders of magnitude greater than would be attainable with state-of-the-art electrical interconnects. The effort will address both development of an ultimately manufacturable and environmentally tolerant optical backplane, and the optical interface concepts required for practical board-to-backplane optical connection. The key functionalities, and compatibility with standard multiboard assembly practices will be demonstrated in a laboratory evaluation system.

Technical progress achieved during the current reporting period, and plans for the next reporting period, are summarized in the following sections.

2.0 Progress Summary.

2.1 AlGaAs Modulator Array Development. Task leader: Dr. Mary Hibbs-Brenner

No activity during the current reporting period.

2.2 AlGaAs Modulator Array Packaging. Task leader: Mr. John Lehman

No activity during the current reporting period

2.3. Polymer Backplane Development. Task leader: Dr. Julian Bristow

No activity during the current reporting period.

2.4 Vertical Cavity Surface Emitting Laser Development. Task leader: Dr. Mary Hibbs-Brenner

No activity during the current reporting period.

3.0. Fourth quarter plans.

3.1. AlGaAs Modulator Array Development.

The modulator array development task is essentially complete.

3.2. AlGaAs Modulator Array Packaging.

The modulator array packaging task is essentially complete.

3.3. Polymer Backplane Development.

The polymer backplane development task is essentially complete.

3.4. Vertical Cavity Surface Emitting Laser Development.

This effort will be continued under the OETC-2 program. No further development will take place under the current program.

4.0. Summary.

Activity during the current reporting period was limited to program management tasks including coordination with other team members, organization and attendance at the OETC User's Group meeting. The only activity remaining on the program is the preparation of the final report.